CASE REPORT – OPEN ACCESS

International Journal of Surgery Case Reports 15 (2015) 74–77

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Preoperatively diagnosed case with co-existence of papillary thyroid carcinoma and cervical tuberculous lymphadenitis

Taku Ito[a,*], Hiroaki Saito[b], Naomi Kishine[a], Takamori Takeda[a], Kota Mizushima[a]

[a] Departments of Otolaryngology, Tsuchiura Kyodo General Hospital, 11-7 Manabeshinmachi, Tsuchiura, Ibaraki 300-0053 Japan
[b] Respiratory Medicine, Tsuchiura Kyodo General Hospital, 11-7 Manabeshinmachi, Tsuchiura, Ibaraki 300-0053, Japan

ARTICLE INFO

Article history:
Received 13 June 2015
Received in revised form 13 August 2015
Accepted 14 August 2015
Available online 18 August 2015

Keywords:
Papillary thyroid carcinoma
Cervical tuberculous lymphadenitis
FNAB
Quantiferon testing
Infection control

ABSTRACT

INTRODUCTION: Papillary thyroid cancer (PTC) is the most frequent histological subtype of thyroid cancer. The lymph node metastasis is found in a high proportion of patients with PTC at the time of surgery. In contrast, tuberculous lymphadenitis remains a common cause of cervical lymphadenopathy in Asian countries.

PRESENTATION OF CASE: We present a 60-year-old woman with coexistence of papillary thyroid carcinoma (PTC) and cervical tuberculous lymphadenitis and to show the usefulness of fine-needle aspiration biopsy (FNAB) and quantiferon testing to distinguish a lymph node metastasis of PTC from tuberculous lymphadenitis.

DISCUSSION: FNAB and quantiferon testing are useful tools to check if enlargement of cervical lymph node is due to tuberculous infection, and a surgical plan should be carefully determined to avoid unnecessary surgical complications and the spread of tuberculous infection.

CONCLUSION: The coexistence of cervical tuberculosis should be considered in the etiology of an enlarged lymph node for patients with PTC.

1. Introduction

The standard of care for the papillary thyroid cancer (PTC) is decided, based on the general and local conditions involving tumor site, size, and lymph node metastasis. Total thyroidectomy is performed in most cases. Neck dissection is added if lymph node metastasis is revealed by ultrasonography, computed tomography (CT) scanning, or fine-needle aspiration biopsy or cytology (FNAB or FNAC) [1–3]. However, recent reports show that thyroidectomy with neck dissection resulted in several percent of patients suffering permanent hypoparathyroidism and transient vocal cord paralysis [3–5]. In addition, it is reported that the mortality due to thyroid cancer is only 1.35 patients per 100,000 people, while its prevalence is approximately 10.4 a year in Japan (http://ganjoho.jp/professional/index.html). Therefore, unnecessary resection should be avoided.

On the other hand, tuberculous lymphadenitis remains a common cause of cervical lymphadenopathy in Asian countries. For example, every third patient in head and neck clinic is diagnosed as tuberculous cervical lymphadenitis in Pakistan [6]. Korean official data reported 73 new patients per 100,000 populations in 2005 [7]. In Japan, the latest report shows that annual average prevalence of tuberculosis infection is 13.4 per 100,000 people (http://www.jata.or.jp/rit/ekigaku/en). Here we report a case of tuberculous lymphadenitis mimicking metastatic lymph nodes from PTC and emphasize that the coexistence of cervical tuberculosis should be considered in the etiology of an enlarged lymph node for the patients with PTC in Japan.

2. Presentation of case

A 60-year-old woman was referred to our outpatient clinic with a gradually enlarging right cervical mass. At the local hospital, she underwent ultrasonography, which showed 10 × 8 and 8 × 8 mm hypoechoic solid lesions with irregular contours and calcification in the bilateral lobes of the thyroid gland (Fig. 1A and B). In our hospital, multiple enlarged lymph nodes with cystic necrosis around internal jugular vein were also observed on the right lateral neck (Fig. 1C). Computed tomography (CT) scanning revealed multiple lymph nodes swelling on paratracheal and the right lateral neck area (Fig. 1D and E). In the thyroid gland, intranodular coarse calcification was observed, as observed with ultrasonography. Fine-needle aspiration biopsy (FNAB) suggested papillary thyroid carcinoma (PTC) and cervical lymphadenitis with multinucleated giant cell formation. QuantiFERON TB-2G (QFT-2G) testing, which is an in vitro diagnostic aid for detecting latent *Mycobacterium tuberculosis*, was positive. Therefore, we clinically diagnosed PTC with cervical tuberculous lymphadenitis. To avoid

* Corresponding author. Fax: +81 29 823 1160.
E-mail address: taku.oto@gmail.com (T. Ito).

http://dx.doi.org/10.1016/j.ijscr.2015.08.026

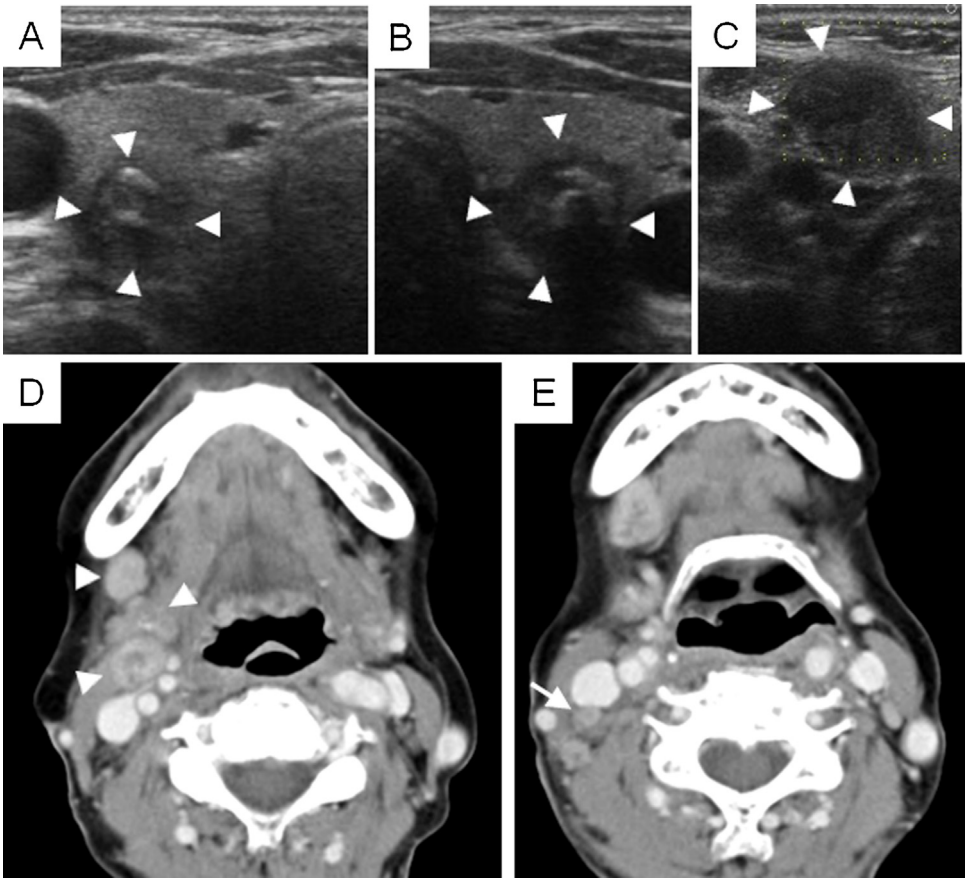

Fig. 1. Preoperative ultrasonographic and enhanced CT study of the tumor The images show a 10 × 8 mm hypoechoic solid lesions with irregular contour and calcification in the right lobe (A) and left lobe (B) of the thyroid gland. Enlarged lymph nodes with cystic necrosis were observed around right internal jugular vein (C). CT scanning revealed swollen conglomerate multiple lymph nodes with central necrosis on the right lateral neck (D,E). Right superior internal jugular and submandibular lymph nodes were also enlarged (D). Note that three arrowheads (D) were corresponding to those in Fig. 3B and the arrow indicates the excised lymph node as sentinel one in this case.

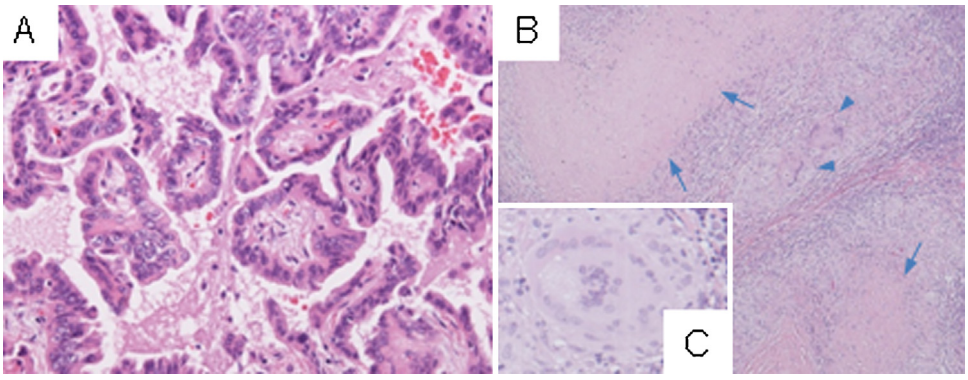

Fig. 2. Pathological findings demonstrating primary thyroid tumor (A) and lateral neck lymph node (B and C). Primary tumor showed typical characteristic features of papillary cancer (A). Excised lymph node included the caseation necrosis (arrow in B) and multinucleated giant cells (arrowhead in B and C), suggesting the infection with the *Mycobacterium tuberculosis*.

the spread of tuberculosis infection during operation, we initially performed a total thyroidectomy and bilateral central neck dissection. After closing the skin incision and completely covering the surgical area with sterile dressings, a cervical lymph node biopsy was subsequently performed on the same day (Fig. 3A). All medical staff wore a N95 face mask. A final pathological examination confirmed primary PTC (Fig. 2A) with multiple paratracheal lymph node metastases. On the other hands, the caseation necrosis and multinucleated giant cells were observed on an excised cervical lymph node, suggesting infection with the *M. tuberculosis* (Fig. 2B and C). We started the patient on antituberculosis medication consisting of isoniaside, rifampicin, pyrazinamide, and etanbutol immediately after the pathological diagnosis. A follow-up CT scan clearly revealed declining cervical lymph nodes and disappearance of necrotic area (Fig. 3B). This finding suggested that the lateral neck lymph nodes swelling was due to tuberculosis infection but not metastasis form PTC. No recurrences of PTC during the past 12 months were observed.

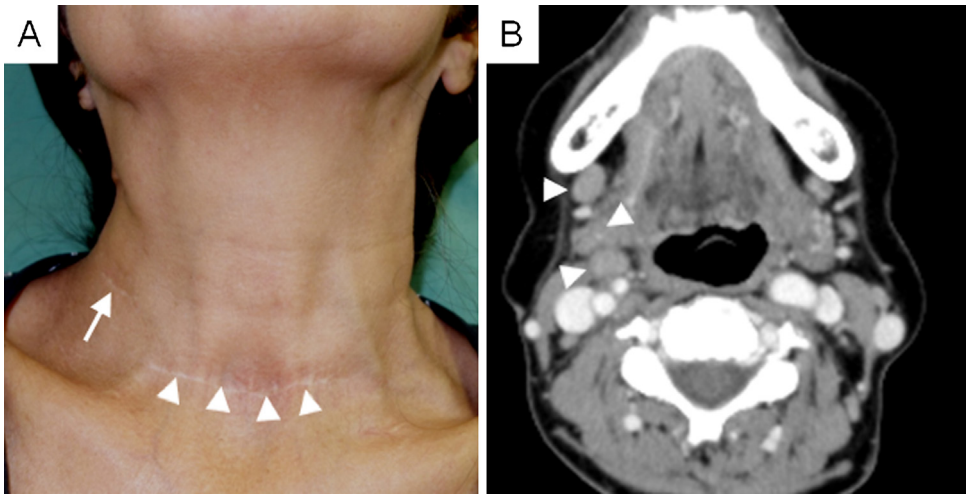

Fig. 3. Skin incision and postoperative enhanced CT study (A) total thyroidectomy and central neck dissection at first (arrowhead). After closing the skin incision and completely covering the surgical area with sterile dressings, cervical lymph node biopsy was undergone (arrow). (B) Postoperative CT scanning demonstrated declining lymph nodes and disappearance of necrotic area. The three arrowheads correspond to those in Fig. 1D.

3. Discussion

Cervical lymphadenitis is the most common clinical presentation of extrapulmonary tuberculosis. There is a history of tuberculous contact in only 21.8% and tuberculous infection in only 16.1% of the cases with cervical lymphadenitis [8]. Cervical tuberculous lymphadenitis may present as a unilateral single or multiple painless mass and is usually found in the supraclavicular area or the posterior triangle of the neck [8,9]. These clinical characteristics are partially common to those of the lymph node metastases from PTC. Nodal metastases associated with PTC generally involve the jugulodigastric and pretracheal nodes. However, submandibular nodal metastases are rare and are usually associated with extensive cervical metastases [2,10,11].

Sonographic features of tuberculosis nodes tend to be round hypoechoic lesions and usually show intranodal cystic necrosis and calcification, which is also very similar to metastatic PTC cervical nodes. On CT, enhanced conglomerate nodal masses are usually observed [12]. The nodes smaller than 2 cm in diameter show varying degrees of homogeneous enhancement [12–14]. In contrast, the larger nodes invariably show central areas of relative low density and peripheral rim enhancement. Enhanced walls are usually irregular in thickness [14]. Similarly, the small metastatic lymph node from PTC may show homogeneous enhancement, simulating inflammatory adenopathy. In the large lymph node, inhomogeneous enhancement or almost complete nodal necrosis can be present, creating a smooth-walled cystic mass that mimics a benign cyst [12]. In our case, CT scanning revealed swollen conglomerate multiple lymph nodes with central necrosis on the right lateral neck (Fig. 1D and E). Enlarged lymph nodes were also observed at submandibular region. Considering that the metastases to the submandibular lymph nodes from PTC were rare, we could suspect the involvement of cervical tuber culosis.

Fine-needle aspiration cytology (FNAC) is sometimes a useful tool in the diagnosis of tuberculous lymphadenitis [15]. It can detect cervical tuberculous lymphadenitis in 25–77% of cases. The sensitivity and specificity of FNAC in the diagnosis of tuberculous lymphadenitis are 88% and 96%, respectively [15]. FNAB is also a sensitive, specific, and cost-effective method to diagnose mycobacterial cervical lymphadenitis [16]. QuantiFERON TB-2G (QFT-2G) testing is relatively new and often used for extrapulmonary tuberculosis. The sensitivity and specificity of this assay were shown to be 70–90% and 90–100%, which is equivalent to the value observed in traditional tuberculin skin test (TST). This testing has the following additional advantages over TST: results are received the same day and the test is unaffected by prior BCG and previous exposure to atypical mycobacteria. QFT-2G testing is one of the powerful supplemental diagnostic tools for extrapulmonary tuberculosis, including cervical tuberculous lymphadenitis.

We preoperatively diagnoses and treated a rare case with coexistence of thyroid cancer and cervical tuberculous lymphadenitis by FNAB and QFT-2G testing. Some similar cases have been reported to date [6,7,17,18], but preoperative diagnosis was impossible for most cases. In only one case [18], cervical tuberculous lymphadenitis was incidentally suspected after FNAC, although the author described that it seemed clinically indistinguishable from a metastatic lymph node even if retrospectively evaluated. We could not distinguish whether cervical lymph nodes enlargement was due to PTC metastasis or tuberculosis infection by clinical findings or imaging studies, either. However, because the large lymph nodes with central necrosis were recognized at uncommon site of metastasis from PTC [19,20], we preoperatively could suspect the coexistence of thyroid cancer and cervical tuberculous lymphadenitis.

Cervical tuberculous lymphadenitis responds well to antituberculous drugs; therefore, surgery has a limited role in the treatment. In general, surgical intervention is limited to guidance in fine-needle aspiration, incision and drainage, and incisional and limited excisional biopsy. Total excision is unnecessary in many cases; it may also be avoided except for cases with a singular mass. In addition, it is necessary to take special care for tuberculous bacterium so it does not spread into a wider area during an operation. To avoid unfavorable complications and widespread of infection, we performed an excisional biopsy (Fig. 3A, arrow). We completely covered the surgical field of total thyroidectomy (Fig. 3A, arrowhead) before biopsy, which showed that lateral lymph nodes enlargement was due to tuberculous infection. Our procedure did not provide any evidence of tuberculous infection among our staff or the patient's family members. Furthermore, there was no sign of recurrence of PTC and lymph nodes declined during the past 12 months (Fig. 3B).

4. Conclusion

In conclusion, the coincident of PTC and tuberculous lymphadenitis are not rare in Asian countries. The large lymph nodes

with central necrosis recognized at uncommon site of metastasis from PTC might remind us of such coexistence.

FNAC and QFT-2G testing are useful for preoperative diagnosis. Preoperative diagnosis for tuberculous infection is important to avoid unnecessary surgical complications and secondary infections.

Conflicts of interest

The authors have no financial or personal conflicts of interest to disclose.

Funding

The authors have no funding sources to declare.

Consent

Written informed consent was obtained from the patient for publication of this case report. A copy of this consent is available for review by the Editor-in-Chief of this journal on request.

Ethical approval

No ethical approval was required or obtained.

Author contributions

TI conceived, designed, and supervised the case report and provided final editing of the article. HS, NK, TT, and KM collected and analyzed the data. All authors read and approved the final manuscript.

Guarantor

Taku Ito.

Acknowledgment

We would like to thank the patient who took the time to share her insights on the impact of her disease.

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